

Annual Report for Smith-Lever Funded Projects

Project Title: Mortality Management
Principal Investigator: Jean F. Bonhotal
Project Start: 10/1/2011 **Project Term:** 9/30/2014
Report Fiscal Year: 2014 **Report Author:** Jean F. Bonhotal

Plan of Work Agricultural Environmental Management
Area(s): Waste Management
Environment & Natural Resources

Executive Summary: Death of animals is a normal occurrence on farms and proper management of mortalities has important implications for nutrient management, herd health, public and environmental health. Catastrophic mortalities from natural or man-made disasters can have even greater implications. It is imperative that best management practices for proper disposal or processing of mortalities be understood and used.

Through educational programs, networking, training and conferences, connections were made and best management practices were conveyed to farmers, butchers, students, agriculture educators and extension agents, as well as agricultural and health-related agencies. In 14 events over the past year, more than 550 agricultural and environmental consultants, regulatory personnel, educators, farmers and butchers received training and outreach materials to put into practice or pass along to their constituents. Additional assistance and information was disseminated to over 200 people through one-on-one meetings, phone and e-mail responses.

Due to the programs CWMI has convened over the last year, livestock producers and agricultural regulators across the United States are adopting “better” best management practices for disposal and processing of mortalities and encouraging more to do the same. In doing so, infectious and contagious diseases are prevented and air, water and soil quality are protected.

Progress Summary: Over this project year, CWMI was invited to lecture in four separate Cornell University classes on the use of carbon, the science of composting and composting at Cornell and around New York State. Through these lectures, 75 college students gained knowledge on the science of mortality composting and the environmental benefits and health and safety of using this tool to manage mortalities. In November, 2013 CWMI taught a two-hour mortality and manure composting course at the 2013 Agriculture In-Service to 30 Cornell Cooperative Extension Agents. The knowledge gained and materials provided in these training sessions will transfer to farm managers and workers across the state to help them improve methods for management of routine farm mortality. CWMI presented at the Disaster Preparedness and Response pre-conference to NYSAR3’s

annual recycling conference. The most effective way to manage a disaster is to be prepared before it happens, and being prepared for animal mortalities is no exception. Seventy-five regulatory and municipal personnel as well as educators and other interested parties learned about animal mortality composting in Schoharie County following Superstorm Sandy in order to be more prepared for future disasters. Fifty 4-Her's at the 4-H Winter Round Up Horse Weekend participated in a workshop on "Composting When it Comes to Horses" to understand the options available to horse owners in the event of their horse's death. Three separate workshops on mortality composting were held in Lancaster, Kingston and Nedrow, NY educating over 125 farmers, personnel from the department of transportation, soil and water conservation, department of environmental conservation and department of health, extension educators and the general public on this important technique for mortality management. CWMI was invited to present at "What Farmer Educators Need to Know about Mortality Composting", a national conference held in Langston, OK in April, 2014. CWMI presented "Quality Assurance in Mortality Composting; Mortality Composting Safety" to an audience of 50 farmer educators from across the country. This presentation was also made into a webinar sponsored by the Livestock and Poultry Environmental (LPE) Learning Center to an audience of educators, regulatory personnel and farmers. This webinar was recorded and is available for viewing by those interested in learning more and/or teaching about mortality composting. In July, 2014, CWMI hosted a five-day US Composting Council Compost Operator's Training Course in which 45 municipal solid waste professionals, business owners, government agency personnel and cooperative extension educators were instructed on compost operations, including mortality management. CWMI has been working with Homeland Security, APHIS, IIAD, the Canadian Government and 13 land grant universities in planning the 5th International Symposium Managing Animal Mortalities, Products, By Products, and Associated Health Risks: Connecting Research, Regulations and Responses in Lancaster, PA.

**Expected and
Observed
Impact/Outcome:**

In the 14 events in which CWMI participated/planned, over 550 agricultural and environmental consultants, regulatory personnel, youth leaders, educators and farmers/growers received training and outreach materials on best management practices in mortality composting to pass along to their constituents, stakeholders and other educators. Training people who can then go on to train others is a cornerstone of CWMI work. As a result of the disaster preparedness and response pre-conference, communication infrastructure has been set up to respond to small and large disasters connecting communities down to the local response level. Participation at the conference in Oklahoma for farmer educators and then repeating the presentations on the LPE Learning Center website is expected to disseminate best management practices to thousands of beginning farmers, high school and college students, as well as professionals. We continue the series of mass mortality response as we are in the planning stages of the 5th International

Symposium Managing Animal Mortalities, Products, By Products, and Associated Health Risks: Connecting Research, Regulations and Responses. This symposium is convened every 2 years with 27 collaborating states, 5 Canadian provinces and 7-10 other countries. With each symposium, more information is shared and more infrastructure is built. Information gleaned at these symposiums has been instrumental in dealing with recent disasters such as floods and heavy snowstorms as well as disease outbreaks such as porcine epidemic diarrhea virus (PEDV). CWMI is also helping to plan the second Waste to Worth, eXtension conference in April 2015, where many BMP's including mortality disposal will be presented. In addition to workshops, conferences and the learning module, more communities of interest are being reached through our web-based map that includes each state's mortality and butcher waste policy and is kept up-to-date so that states can collaborate and get the most reasonable and protective policy enacted. The information gleaned from this map is useful in facilitating the development of workable carcass disposal solutions that are based on the lowest risk to both people and the environment.

**Multi-State
Activities:**

OK: Presented at a national conference - What Farmer Educators Need to Know about Mortality Composting
 OK, SD: Collaboration to putting educational materials and webinars on the Livestock and Poultry Environmental Learning Center website, an online eXtension resource.
 CA: Hosted and taught portions of the US Composting Council Training Course.
 OK, VA: Continued exploration of the fate of pharmaceuticals in compost and soil, and quality of leachate from compost piles.
 OK, PA: Quality Assurance in Mortality Composting and Safety
 CA: New Research in Compost Benefits.
 CA: Implementing Composting in Schools: Integrating Composting into the Curriculum.
 VT: Using Quality Residuals to Build Soil
 13 land grant universities, CANADA, Homeland Security, APHIS, IIAD: Planning the 5th International Symposium Managing Animal Mortalities, Products, By Products, and Associated Health Risks: Connecting Research, Regulations and Responses.
 NJ, NE, WA, WI, TX: Planning the National Waste to Worth conference

Publication(s):

Payne, J., Farris, R., Parker, G., Bonhotal, J., and Schwarz, M. Quantification of sodium pentobarbital residues from equine mortality compost piles. Submitted to Journal of Animal Science Sept. 2014.

Schwarz, M and Bonhotal, J. Quality Assurance in Mortality Composting, Mortality Composting Safety. Proceedings from What Farmer Educators Need to Know about Mortality Composting, Langston, OK. April, 2014.

Bonhotal, J., Schwarz, M., Rynk, R. 2014. Composting Animal Mortalities. Cornell Waste Management Institute. pg 1-23. Available at http://cwmi.css.cornell.edu/Composting_Animal_Mortalities.pdf.

Communication(s): US Mortality and Butcher Waste Disposal Laws. Interactive map updated continually. Available at <http://compost.css.cornell.edu/mapsdisposal.html>. Use of this map allows for collaboration between US states to get the most reasonable and protective policies enacted.

Livestock Mortality Composting – Beyond the Basics Part 2. Archived webcast on the eXtension website for the Livestock and Poultry Environmental Learning Center.

<https://learn.extension.org/events/1683#.VH4d7MmZgV9>. Archived materials allow for a greater reach in education not only those that will actually handle mortalities, but also allows the public to understand the science behind it which in turn fosters greater acceptance

Presentation(s): Use of Carbon in Waste Management; October 11, 2013; 1 hour; instructor; students; 15.

Specialty Debris Management - Animal Mortality Composting in Schoharie County following Superstorm Sandy; November 12, 2013; 2 hours; presenter; recycling professionals & coordinators, decision-makers, state & business officials; 75.

Best Management Practices for Mortality Composting; November 20, 2013; 1 hour; instructor; CCE agents; 21.

Creating a Value-Added Product through Manure Composting; November 20, 2013; 1 hour; instructor; CCE agents; 21.

Composting When It Comes to Horses; February 22, 2014; 1 hour; instructor; 4-H students; 50.

Science of Composting; March 5, 2014; .66 hours; instructor; students; 25.

Composting at Cornell and around NYS; March 13, 2014; 0.83 hours; instructor; students; 14.

Composting Roadkill; March 28, 2014; 1.5 hours; instructor; farmers and NYS DOT; 20.

Manure and Mortality Composting; April 17-18, 2014; 12 hours; instructor; SWCD, NYSDOH, NYSDEC, CCE, farmers, municipal officials; 70.

Quality Assurance in Mortality Composting, Mortality Composting Safety; April 24, 2014; 0.66 hours; instructor; farmer educators; 50.

Making Compost Work for Onondaga Nation; July 9, 2014; 3 hours; instructor; 36.

Fundamentals of the Composting Process; July 31, 2014; 4.5 hours;

instructor; government agencies, cooperative extension, business owners, municipal solid waste professionals; 45.

Composting and System Methods; August 1, 2014; 3 hours; instructor; government agencies, cooperative extension, business owners, municipal solid waste professionals; 45.

Site Selection and Design; August 1, 2014; 3 hours; instructor; government agencies, cooperative extension, business owners, municipal solid waste professionals; 45.

Quality Assurance & Safety in Mortality Composting; September 19, 2014; .33 hours; presenter; farmers and cooperative extension educators; 62.

**Project
Conclusion:**

Following unexpected animal losses, producers need to consider all available management options, associated costs and environmental effects of mortality disposal. This calls for planning, coordination, networking, development of educational tools and establishing relationships with those who need help and those who are there to assist. Access to current information on disposal options, associated regulations, and available capacity of local service providers are important for proper disposal and disease control. Over the past three years, this project has developed science-based educational materials disseminated through workshops, presentations and conferences, peer-reviewed journal articles and web-based fact sheets, as well as train-the-trainer sessions and one-on-one conversations with policy makers, farmers, agricultural professionals, students and other stakeholders.

Over the past three years, CWMI held 36 events that provided assistance to over 2200 farmers, agricultural advisors, environmental consultants, business and municipal personnel, regulatory personnel, youth leaders, educators and the general public on mortality composting, insuring improved water quality and economics as well as highlighting health and safety information. Through smaller events, one-on-one meetings and phone and e-mail responses, CWMI provided assistance to an additional 1500.

Specific publications and communications from this project include a fact sheet and DVD on Natural Rendering for Horses which has been used widely in programming to give horse owners disposal options. Research conclusions on the fate of veterinary pharmaceuticals are included in the information so that livestock owners have good information on disposal of euthanized animals and results were published in horse publications and scientific journals. "Knowledgeable, Ready and Able: Agro-security Information for the Livestock Industry" is an Extension Disaster Education Network (EDEN) white paper that was developed during this project in conjunction with the universities of Iowa, Michigan, Maine and UC Davis to educate producers, industry suppliers and service providers about pre-event identification and reduction of livestock emergency factors, as well as improve emergency decision making and response. This information is available on the web and is

material that local Extension offices can access easily as they are the ones that generally get the first call in the aftermath of catastrophic livestock loss. CWMI, along with Oklahoma State University and North Dakota University developed a Livestock and Poultry Mortality Management Learning Module for use by educators and agriculture instructors. This module has reached thousands of beginning farmers, high school and college students, as well as professionals that need continuing education nationwide. CWMI created a web-based map that includes each state's mortality and butcher waste policy. This map has been kept up-to-date so that states can collaborate and get the most reasonable and protective policy enacted. The information gleaned from this map is useful in facilitating the development of workable carcass disposal solutions that are based on the lowest risk to both people and the environment. Many states refer livestock producers to educational materials produced by Cooperative Extension programs such as CWMI as Best Management Practices (BMPs) for disposal. Due in part to programs in which CWMI participated or created, composting is listed as a preferred method of disposal in 66 documents for 43 states. "Fate of Barbiturates and Non-steroidal Anti-inflammatory Drugs during Carcass Composting" was published in Trends in Animal and Veterinary Sciences Journal. Another article has been submitted to the Journal of Environmental Quality. All educational materials developed over this project period are available on our continually updated mortality composting page on CWMI's website (<http://cwmi.css.cornell.edu/mortality.htm>). This website continues to receive thousands of hits and gives resources needed to not only understand the issues but to generate dialog.

Presentations and trainings have included the 2013 Water Quality Symposium sponsored by the NYS Conservation District Employees' Association, the State Soil and Water Conservation Committee and the NYS Department of Agriculture and Markets, Waste to Worth in Denver, CO, NYS 4-H Horse In-Service program, NYS Agriculture In-Service program for extension educators, Disaster Preparedness at the NYSAR3 conference, What Farmer Educators need to Know about Mortality Composting in Oklahoma, college lectures and numerous webinars. These events were attended by over 500 people and the webinars attracted thousands more. In addition, CWMI played an integral role in planning, executing and evaluating the 4th International Symposium on Managing Animal Mortality, Products, By-Products, and Associated Health Risk: Connecting Research, Regulation, and Response. This Symposium was a forum for exchange of information. Experts (including vets, animal industry and government professionals, academics, cooperative extension agents, ag emergency managers, and rendering professionals) from around the world met in Dearborn, MI, to hear and view presentations, demonstrations/tours and participate in a disease response workshop. This event hosted 150 participants from 7 countries, including 27 states in the US and 5 provinces in Canada.

CWMI collaborated on three research efforts related to mortality

disposal with Oklahoma State, Virginia Tech and Virginia Department of Transportation to further explore the fate of pharmaceuticals in compost and soil, and quality of leachate from piles. Through a NE SARE grant, CWMI trained and worked with training teams on mortality disposal in New York and other northeast states for routine mortality and events with larger animal loss. In addition, we worked with regulators in six states to put sound disposal policy in place and set direction for research, policy and outreach. Programs included work with USDA APHIS, EPA, NYSDEC, NYS Department of Ag & Markets, Department of Homeland Security's Science & Technology Directorate and the National Center for Foreign Animal Disease and Zoonotic Disease (FAZD), National Pork Board, National Rendering Association and 20 Universities that are working on mortality disposal.

**Other External
Funding to
Continue:**

No,